Plant Physiol. (1986) 81, x–xii
0032-0889/86/81/x/$01.00/0

Author Index

A

Abe, Shunnosuke, 1151
Abeles, Fred B., 780
Adams, William W. III, 297
Aducci, Patrizia, 812
Akazawa, Takashi, 60, 222, 313, 1008, 1044
Alexandre, Joël, 1147
Ali, Md. Showkat, 222
Alibert, Gilbert, 460
Allen, Cheryl D., 1014
Aloni, Beny, 482
An, Gynheung, 86, 301
Andrews, Chris J., 361
Anthon, Gordon E., 1080
Aphalo, Pedro J., 768
Arnscheidt, Angelika, 516
Ascenzi, Paolo, 812
Auderset, Guy, 177
Avron, Mordhay, 92, 875
Azcon-Bieto, Joaquim, 379

B

Ballio, Alessandro, 812
Barlow, Edward W., 423
Barrs, Henry D., 45
Bascomb, Newell F., 349, 413, 527
Baskin, Tobias I., 306
Bassi, Pawan K., 950
Bauwe, Hermann, 329
Beale, Samuel I., 965
Beer, Sven, 937
Beier, Ross C., 997
Ben-Amotz, Ami, 875
Ben-Gad, David, 268
Bennett, Alan B., 830
Berger, Michael G., 356
Berry, Joseph A., 788
Bevege, David I., 423
Bhaskaran, Shyamala, 626
Bhaya, Devaki, 960
Bienfait, H. Frits, 842
Biggs, M. Scott, 395
Birnberg, Paul R., 984, 991
Bishop, David G., 946
Bisson, Mary A., 55
Blevins, Dale G., 293, 553
Bloom, Arnold J., 67
Blumenfeld, Amos, 130
Blumwald, Eduardo, 120
Boag, Stuart, 115
Böger, Peter, 939
Bonilla, I., 430
Borkird, Chumpol, 1143
Boudet, Alain M., 460
Bouton, Joseph H., 212
Boyle, Sheila A., 817
Brandt, Peter, 548
Braun, Yael, 1050, 1057
Brenner, Mark L., 699, 984, 991
Briggs, Winslow R., 306, 1033
Brightman, Andrew, 177
Brouquisse, Renaud, 247
Brown Harold R., 212
Browse, John, 859
Bruinsma, J., 980
Brummett, Donald L., 997
Bush, Daniel R., 1022

C

Cahill, David M., 1103
Caldwell, Martyn M., 390
Canut, Hervé, 460
Canvin, David T., 200
Cardemil, Liliana, 1062
Carrasco, Antoine, 460
Carroll, Bernard J., 572
Carroll, Edward J., Jr., 869
Castelfranco, Paul A., 960
Ceresa, Anthony, 45
Chamel, André, 689
Chappell, Joseph, 50
Cheeseman, John M., 742
Chen, Yuh-Ru, 609
Cheng, Kwan-Hon, 954
Cherel, Isabelle, 376
Chiang, Chin C., 301
Choi, Jung H., 1143
Chrispeels, Maarten J., 50, 206, 320
Christoffersen, Rolf E., 830
Chung, Alfred, 323
Conn, Eric E., 711, 717
Conroy, Jann P., 423
Consolacion, Evangeline D., 950
Cornish, Katrina, 1017
Coscia, Carmine J., 161
Cramer, Grant R., 792
Crouch, Martha L., 907
Croxdale, Judith G., 186

D

Dainty, Jack, 758
Danko, Stephen J., 329
Datko, Anne H., 103, 285, 577
Davenport, Thomas L., 26, 323
Davies, Frederick, S., 289
Davies, Peter J., 984, 991
De Guzman, Constancio D., 408
Dela Fuente, Rollo K., 408, 646, 651
Delmer, Deborah P., 913
Demets, René, 522
De Michelis, Maria I., 542
Dennis, David T., 12, 817
Desmaison, Anne Marie, 692
Desmet, Gilbert G., 1003
Douce, Roland, 247
Dry, Ian B., 587
Dudley, Mark W., 335, 343
Dueber, Michael T., 335
Dugger, W. M., 464
Duke, Stephen O., 882
Dunlap, James R., 934
Dybing, C. Dean, 97, 1069

E

Eberle, Joachim, 516
Edwards, Gerald E., 663, 669
Elbein, Alan D., 383, 1086
Elrifi, Ivor R., 273
Epstein, Emanuel, 792
Esen, Asim, 70
Espelie, Karl E., 487
Esquerré-Tugayé, Marie-Thérèse, 228
Evans, Michael L., 439
Evans, Philip T., 212

F

Falkowski, Paul G., 310
Fanberstein, Luba, 1140
Fawley, Marvin W., 149
Faye, Loïc, 206
Fechner, A., 714
Fernández-Valiente, E., 430
Finazzo, John, 67
Finkelstein, Ruth R., 907
Flore, James A., 289
Flurkey, William H., 614
Fock, Heinrich P., 356, 372
Foley, Michael E., 696
Franceschi, Vincent R., 487
Frey, Steven M., 326
Fujii, Tadashi, 931
Fujita, Yoshihiko, 310

G

Gaillard, Jacques, 247
Gallagher, Sean R., 869
Gardner, Gary, 1014
Gent, Martin P. N., 1069
Gerasimowicz, Walter V., 925
Gerasimowisz, Walter V., 1130
Gerhardt, Richard, 1123
Ghiasi, H., 1069
Gilliland, Margaret G., 1027
Ginzburg, Chen, 259, 268
Giovanelli, John, 577
Glass, Anthony D. M., 1
Gorz, Herman J., 329
Gottlieb, Leslie D., 367
Grant, Bruce R., 1103
Grantz, David A., 865
Green, Terrence R., 343
Gresshoff, Peter M., 572
Griffith, Christopher J., 120
Griffith, Marilyn, 471
Griffith, Stephen, 482
Grignon, Claude, 847
Grossman, Arthur R., 149
Guinn, Gene, 997
Gurevitch, Jessica, 678

H

Hahlbrock, Klaus, 216
Hallgren, Lars, 630
Hampp, Rüdiger, 854
Handa, Avtar K., 395
Hanft, Jonathan M., 503, 511
Hansen, Annette, 630
Harada, Hiroshi, 931
Harper, James E., 593
Harriman, Robert W., 395
Hase, T., 976
Hasegawa, Koji, 976, 980
Hasenstein, Karl-Heinz, 439
Hashimoto, Takashi, 619
Haskins, Francis A., 329
Hassidim, Miriam, 1050, 1057
Hayden, Donald B., 471
Heber, Ulrich, 597
Heigaard, Jørn, 630
Heineke, Dieter, 1123
Heldt, Hans W., 1123
Hemmingsen, Sean M., 12, 817

Plant Physiol. (1986) 81, x–xii
0032-0889/86/81/x/$01.00/0

Author Index

A

Abe, Shunnosuke, 1151
Abeles, Fred B., 780
Adams, William W. III, 297
Aducci, Patrizia, 812
Akazawa, Takashi, 60, 222, 313, 1008, 1044
Alexandre, Joël, 1147
Ali, Md. Showkat, 222
Alibert, Gilbert, 460
Allen, Cheryl D., 1014
Aloni, Beny, 482
An, Gynheung, 86, 301
Andrews, Chris J., 361
Anthon, Gordon E., 1080
Aphalo, Pedro J., 768
Arnscheidt, Angelika, 516
Ascenzi, Paolo, 812
Auderset, Guy, 177
Avron, Mordhay, 92, 875
Azcon-Bieto, Joaquim, 379

B

Ballio, Alessandro, 812
Barlow, Edward W., 423
Barrs, Henry D., 45
Bascomb, Newell F., 349, 413, 527
Baskin, Tobias I., 306
Bassi, Pawan K., 950
Bauwe, Hermann, 329
Beale, Samuel I., 965
Beer, Sven, 937
Beier, Ross C., 997
Ben-Amotz, Ami, 875
Ben-Gad, David, 268
Bennett, Alan B., 830
Berger, Michael G., 356
Berry, Joseph A., 788
Bevege, David I., 423
Bhaskaran, Shyamala, 626
Bhaya, Devaki, 960
Bienfait, H. Frits, 842
Biggs, M. Scott, 395
Birnberg, Paul R., 984, 991
Bishop, David G., 946
Bisson, Mary A., 55
Blevins, Dale G., 293, 553
Bloom, Arnold J., 67
Blumenfeld, Amos, 130
Blumwald, Eduardo, 120
Boag, Stuart, 115
Böger, Peter, 939
Bonilla, I., 430
Borkird, Chumpol, 1143
Boudet, Alain M., 460
Bouton, Joseph H., 212
Boyle, Sheila A., 817
Brandt, Peter, 548
Braun, Yael, 1050, 1057
Brenner, Mark L., 699, 984, 991
Briggs, Winslow R., 306, 1033
Brightman, Andrew, 177
Brouquisse, Renaud, 247
Brown Harold R., 212
Browse, John, 859
Bruinsma, J., 980
Brummett, Donald L., 997
Bush, Daniel R., 1022

C

Cahill, David M., 1103
Caldwell, Martyn M., 390
Canut, Hervé, 460
Canvin, David T., 200
Cardemil, Liliana, 1062
Carrasco, Antoine, 460
Carroll, Bernard J., 572
Carroll, Edward J., Jr., 869
Castelfranco, Paul A., 960
Ceresa, Anthony, 45
Chamel, André, 689
Chappell, Joseph, 50
Cheeseman, John M., 742
Chen, Yuh-Ru, 609
Cheng, Kwan-Hon, 954
Cherel, Isabelle, 376
Chiang, Chin C., 301
Choi, Jung H., 1143
Chrispeels, Maarten J., 50, 206, 320
Christoffersen, Rolf E., 830
Chung, Alfred, 323
Conn, Eric E., 711, 717
Conroy, Jann P., 423
Consolacion, Evangeline D., 950
Cornish, Katrina, 1017
Coscia, Carmine J., 161
Cramer, Grant R., 792
Crouch, Martha L., 907
Croxdale, Judith G., 186

D

Dainty, Jack, 758
Danko, Stephen J., 329
Datko, Anne H., 103, 285, 577
Davenport, Thomas L., 26, 323
Davies, Frederick, S., 289
Davies, Peter J., 984, 991
De Guzman, Constancio D., 408
Dela Fuente, Rollo K., 408, 646, 651
Delmer, Deborah P., 913
Demets, René, 522
De Michelis, Maria I., 542
Dennis, David T., 12, 817
Desmaison, Anne Marie, 692
Desmet, Gilbert G., 1003
Douce, Roland, 247
Dry, Ian B., 587
Dudley, Mark W., 335, 343
Dueber, Michael T., 335
Dugger, W. M., 464
Duke, Stephen O., 882
Dunlap, James R., 934
Dybing, C. Dean, 97, 1069

E

Eberle, Joachim, 516
Edwards, Gerald E., 663, 669
Elbein, Alan D., 383, 1086
Elrifi, Ivor R., 273
Epstein, Emanuel, 792
Esen, Asim, 70
Espelie, Karl E., 487
Esquerré-Tugayé, Marie-Thérèse, 228
Evans, Michael L., 439
Evans, Philip T., 212

F

Falkowski, Paul G., 310
Fanberstein, Luba, 1140
Fawley, Marvin W., 149
Faye, Loïc, 206
Fechner, A., 714
Fernández-Valiente, E., 430
Finazzo, John, 67
Finkelstein, Ruth R., 907
Flore, James A., 289
Flurkey, William H., 614
Fock, Heinrich P., 356, 372
Foley, Michael E., 696
Franceschi, Vincent R., 487
Frey, Steven M., 326
Fujii, Tadashi, 931
Fujita, Yoshihiko, 310

G

Gaillard, Jacques, 247
Gallagher, Sean R., 869
Gardner, Gary, 1014
Gent, Martin P. N., 1069
Gerasimowicz, Walter V., 925
Gerasimowisz, Walter V., 1130
Gerhardt, Richard, 1123
Ghiasi, H., 1069
Gilliland, Margaret G., 1027
Ginzburg, Chen, 259, 268
Giovanelli, John, 577
Glass, Anthony D. M., 1
Gorz, Herman J., 329
Gottlieb, Leslie D., 367
Grant, Bruce R., 1103
Grantz, David A., 865
Green, Terrence R., 343
Gresshoff, Peter M., 572
Griffith, Christopher J., 120
Griffith, Marilyn, 471
Griffith, Stephen, 482
Grignon, Claude, 847
Grossman, Arthur R., 149
Guinn, Gene, 997
Gurevitch, Jessica, 678

H

Hahlbrock, Klaus, 216
Hallgren, Lars, 630
Hampp, Rüdiger, 854
Handa, Avtar K., 395
Hanft, Jonathan M., 503, 511
Hansen, Annette, 630
Harada, Hiroshi, 931
Harper, James E., 593
Harriman, Robert W., 395
Hase, T., 976
Hasegawa, Koji, 976, 980
Hasenstein, Karl-Heinz, 439
Hashimoto, Takashi, 619
Haskins, Francis A., 329
Hassidim, Miriam, 1050, 1057
Hayden, Donald B., 471
Heber, Ulrich, 597
Heigaard, Jørn, 630
Heineke, Dieter, 1123
Heldt, Hans W., 1123
Hemmingsen, Sean M., 12, 817

Hendrix, Donald L., 584
Hiller, Larry K., 167
Hinrichs, Imma, 939
Homblé, Fabrice, 919
Hoober, J. Kenneth, 702
Hori, Hidetaka, 383
Horwitz, Benjamin A., 726
Huber, Steven C., 584, 674, 1008
Huff, Albert, 30
Huner, Norman P. A., 471
Hurkman, William J., 802

I

Iino Moritoshi, 306
Incharoensakdi, Aran, 1044
Israel, Alvaro, 937
Iwagawa, T., 976

J

Jackson, Patricia C., 1130
Jacobson, Louis, 1022
Jagendorf, André T., 603
Jenard, André, 919
Jenkins, Colin L. D., 115
Jensen, Richard G., 81
Jiao, Xin-Zhi, 637
Johnson, Kenneth D., 206
Johnson-Flanagan, Anne M., 21
Jolliff, Gary D., 136
Jones, Alan M., 1014
Jones, Robert J., 503, 511
Jones, Thomas W. A., 367
Jorgensen, Kim G., 630

K

Kaestner, Klaus H., 497
Kamada, Hiroshi, 931
Karni, Lea, 875
Karni, Leah, 92
Katterman, Frank Reinald, 681
Kaufman, Lon S., 1033
Kaushal, Gur P., 383, 1086
Keller, Barbara J., 702
Kenrick, Janette R., 946
Kenyon, William H., 882
King, Bryan J., 192
Kleczkowski, Kazimierz, 404
Kleczkowski, Leszek A., 656, 1110
Klein, Richard M., 723
Klix, Dieter, 516
Klug, Klaus, 372
Kolattukudy, P. E., 487
Koller, David C., 167
Kombrink, Erich, 216
Kresovich, Stephen, 934
Krick, Thomas P., 984
Krishnan, Hari B., 642, 748
Kruger, Nicholas J., 12
Kunce, Christine M., 1134
Küppers, Manfred, 423
Kusnan, Misri, 356
Kutchan, Toni M., 161

L

Labavitch, John M., 929
Laloraya, Manmohan M., 253
Lance, Claude, 1039
Lara, Catalina, 686
LaRue, Thomas A., 972, 1092, 1097
Lassalles, Jean-Paul, 1147
Läuchli, André, 792
Lavee, Shimon, 1140
Lawrence, Margaret E., 708
Layzell, David B., 200
Lazof, Dennis, 742
Leaver, Christopher J., 762
Legge, Raymond L., 954
Leigh, Roger A., 497
Lembrechts, Johan F., 1003
Leonard, Robert T., 869
Lepock, James R., 954
Lerner, Henri R., 454, 1050, 1057
Ley, Arthur, 310
Li, Paul H., 699
Lin, Willy, 8
Lipson, Edward D., 726
Liu, Xiang-Qin, 603
Lonergan, Scott G., 717
Lovatt, Carol J., 774
Lubberding, Henk J., 842
Lucas, William J., 171
Lue-Kim, Hubert, 896

M

MacKown, Charles T., 17
Macrae, Sharmane, 1027
Maki, Sonja L., 984, 991
Mancinelli, Alberto L., 922
Mansager, Eugene R., 434
Marion-Poll, Annie, 376
Marks, Dawn B., 702
Markwell, John P., 329
Martin, Barry A., 41, 798
Martin, Hilary V., 889
Mateo, P., 430
Matile, Philippe, 444
Matsumoto, Hideaki, 754
Mauzerall, David, 310
Mayfield, Stephen P., 30
McCourt, Peter, 859
McDaniel, Carl N., 36
McGee, Robert E., 934
Mehrle, Werner, 854
Meyer, Christian, 376
Mikola, Leena, 823
Millard, Merle, 177
Millhollon, Eddie P., 280
Mitchell, Michelle K., 553
Molin, William T., 413
Moore, Brandon D., 663, 669
Moore, D. James, 177
Mori, Hitoshi, 313
Morrow, David L., 171
Mudd, S. Harvey, 103, 285, 577
Munck, Lars, 630
Mundy, John, 630

N

Neumann, Peter M., 689
Newton, Ronald J., 626
Nieder, Matthew, 156
Nir, Gil, 1140
Nishida, Kojiro, 297
Nishimura, Mikio, 313
Nishitani, K., 980
Nissen, Scott J., 696
Noguchi, H., 976, 980
Norman, Helen A., 731
Nozzolillo, Constance, 253

O

Oaks, Ann, 754, 901
Obokata, Junichi, 705
Okita, Thomas W., 642, 748
Oosterhuis, Derrick M., 684
Ormrod, Douglas P., 737
Orr, Glenda R., 807
Osmond, C. Barry, 297
Osterman, John, 329
Owens, John N., 21

P

Paech, Christian, 97, 1069
Palmer, Raymond L., 464
Parks, Brian M., 75
Penel, Claude, 177
Pesci, Pier-Antonio, 454
Pfanz, Hardy, 597
Pfeffer, Philip E., 925, 1130
Philosoph-Hadas, Sonia, 637
Pichersky, Eran, 367
Pick, Uri, 92, 875
Pierce, John, 943
Pierini, Marco, 812
Pilet, Paul-Emile, 889
Poff, Kenneth L., 75
Pomeroy, M. Keith, 361
Poole, Ronald J., 120, 126
Poovaiah, B. W., 836
Possingham, John V., 708
Prunkard, Donna E., 349, 413
Purohit, Sadhana, 253
Puryear, Jeffrey D., 626

Q

Quail, Peter H., 1014

R

Rabe, Etiene, 774
Rabino, Isaac, 922
Raikhel, Natasha V., 558
Raison, John K., 807
Randall, Douglas D., 656, 1110
Raschke, Klaus, 1123
Rastogi, Vipin, 901
Rauser, Wilfried E., 896
Rawsthorne, Stephen, 1092, 1097
Rea, Philip A., 120, 126
Reeves, Christopher D., 642
Reinhold, Leonora, 454, 1050, 1057
Reynolds, Paul H. S., 293, 553
Rhodes, David, 754
Ric de Vos, C., 842
Rijven, Antonius H. G. C., 448
Rinne, Robert W., 41, 798
Riov, Joseph, 130
Robert, Francoise M., 142
Roberts, Linda, L., 1033
Robinson, Ralph W., 349
Roby, Dominique, 228
Romero, José M., 686
Ross, Stephen, 758
Roux, Stanley J., 609
Rouze, Pierre, 376
Rush, Michael, 161
Russell, Scott D., 317
Rustin, Pierre, 1039
Ryan, James W., 323

S

Saini, Hargurdeep S., 950
Salas, Elizabeth, 1062
Salminen, Seppo O., 538
Salomon, Raphael, 259
Sánchez, Rodolfo A., 768
Sanchez-Maeso, E., 430
Sandelius, Anna Stina, 177
Sasakawa, Hideo, 972
Sasaki, Ken, 493
Satoh, Shinobu, 931
Schaefer, Nick L., 45
Scherer, Siegfried, 939

Schmidt, Robert R., 349, 413, 527
Schneegurt, Mark, A., 36
Schneegurt, Mark A., 965
Schoper, John B., 798
Schraudolf, H., 714
Schröppel-Meier, Gabriele, 390
Seddigh, Majid, 136
Seebergts, Christopher J., 875
Seemann, Jeffrey R., 788
Seftor, Richard E. B., 81
Sharkey, Thomas D., 788, 1123
Shinkle, James R., 533
Shulman, Yair, 1140
Siddiqi, M. Yaeesh, 1
Siehl, Daniel L., 711
Sigon, Corrien A. M., 522
Singh, Bijay K., 711, 717
Sitrit, Yaron, 130
Smillie, Robert M., 423
Smith, Roberta H., 626
Smith, Steven M., 762
Soler, André, 847
Somerville, Chris, 859
Soole, Kathleen L., 587
Southwick, Stephen M., 26, 323
Spanswick, Roger M., 542, 1080
Spencer, Mary S., 950
Sprengart, Michael L., 356
Srivastava, Hari S., 737
Staehelin, L. Andrew, 234, 242
Stafstrom, Joel P., 234, 242
Stegwee, Durk, 522
Stevenson, Lisa, 253
Stitt, Mark, 1115, 1123
St. John, Judith B., 731
Streeter, John G., 538
Streit, Luc, 593
Sturm Arnd, 320
Su, Ling-Yuan, 637
Sueltemeyer, Dieter F., 372
Sugiyama, Tatsuo, 674
Sung, Z. Renee, 1143
Süss, Karl-Heinz, 192
Suttle, Jeffrey C., 434
Sze, Heven, 497
Szumilo, Tadeusz, 383

T

Takabe, Tetsuko, 1044
Takabe, Teruhiro, 60
Takabe, Tetsuko, 60
Takeda, Junko, 1151
Tanaka, Charlene K., 802
Tang, Pauline M., 646, 651
Taylor, Iain E. P., 493
Teeri, James A., 678
Thelen, Michael P., 913
Thellier, Michel, 1147
Thibaud, Jean-Baptiste, 847
Thomas, John Calvin, 681
Thompson, Gregory A., 577
Thompson, John E., 954
Thompson, William F., 1033
Tixier, Marie, 692
Tomos, A. Deri, 478
Tomson, Anna M., 522
Tong, Cindy B., 929
Toppan, Alain, 228
Trad, Chafia H., 726
Trelease, Richard N., 1134
Trickett, Edward S., 45
Triplett, Eric W., 566
Tu, Shu-I, 925
Turner, Katherine J., 527
Turner, Matthew, 678
Turpin, David H., 273

U

Urban, James E., 326

V

Van Denburgh, Roy W., 167
Van Den Ende, Herman, 522
Vanderveer, Peter J., 186
Van Sanford, David A., 17
Van Staden, Johannes, 1027
Veluthambi, K., 836
VerNooy, Charles D., 8
Vodkin, Lila O., 558

W

Wagner, Walter, 444
Wang, Shu-Zhen, 70
Wang, Yanzhi, 497
Watad, Abd-Elrahem A., 454
Watson, Brian D., 301
Weiler, Elmar W., 516
West, Charles A., 335, 343
Weste, Gretna M., 1103
Wielgat, Bernard, 404
Wiemken, Andres, 444
Williams, Larry E., 280
Winter, Jörg, 548
Winter, Klaus, 390
Wiskich, Joseph T., 587
Wong, Peter P., 142
Wullschleger, Stan D., 684
Wyse, Roger E., 478, 482

Y

Yamada, Yasuyuki, 619
Yamaguchi, Junji, 313
Yamaya, Tomoyuki, 754
Yandow, Tim S., 723
Yang, Shang Fa, 156, 637, 929
Yip, Wing-Kin, 156
Yokota, Sadaki, 313
Yordanov Ivan T., 192

Z

Zamski, Eliezer, 478
Zeevaart, Jan A. D., 1017
Zeiger, Eduardo, 865
Zhang, Cheng-Lie, 699
Zimmermann, Ulrich, 854

Plant Physiol. (1986) 81, xiii–xxii
0032-0889/86/81/xiii/$01.00/0

Subject Index

A

Abortion, induced
maize kernels, carbohydrate concentration and acid invertase activity, 503
maize kernels, carbohydrate carbon distribution, 511
Abscisic acid
accumulation, isolated guard cells, *Pisum sativum* and *Vicia faba*, 1017
glucose ester, synthesis and purification technique, 323
indoleacetic acid and, purification and measurement, high performance liquid chromatography, 997
induced stomatal closure, reversal, *trans*-cinnamic and *p*-coumaric acid, 253
metabolism, mefluidide treatment, chilled corn leaves, 699
Abscission
anthesis to, ovary growth, soybean, 1069
cotton cotyledons, phenylacetic acid, 434
Absorbance, changes, light-induced, *Trichoderma* mutants, 726
Acer pseudoplatanus (*see* Sycamore)
Acetobacter xylinum, UDP-glucose glucosyltransferases, *gel-electrophoresis separation*, 913
N-Acetylglucosamine, purification and properties, mung bean seedling, 1086
Acid, nocturnal, synthesis, respiratory CO_2 and CAM plants, 390
Acid carboxypeptidases, grains and leaves, wheat, 823
Acid invertase, carbohydrate concentration patterns and, kernel abortion in maize, *503*
Acifluorfen, photosynthesis, cucumber, 882
Aconitase, iron-sulfur clusters, mitochondria, potato, 247
Adenosine monophosphate, phosphate effects and, threonine and cystathionine, *Lemna paucicostata*, 577
Adenosine nucleotides, changes, low temperature stress, winter wheat, 361
Adenosine triphosphatase
electrical noise measurements, red beet vacuoles, 1147
H^+-
Golgi membrane system, sycamore, 222
tonoplast vesicle stimulation and inhibition, beet, 120
hydrogen pump modulation, salinity during growth, *Atriplex nummularia*, 1050
plasma membrane, tomato root, 1080
proton pumping inhibitors, *Chara corallina*, 55
pyrophosphatase and, separation of tonoplast, beet, 126
salinity resistance, development of membrane potential, potassium, 1057
vanadate-sensitive, membrane vesicles, corn roots, 542
Adenosine triphosphate, DNP and, nuclear magnetic resonance assessment, barley roots, 1130
Adenylate kinase, purification and partial characterization, maize leaf, 1110
ADP-glucose, pyrophosphorylase, tissue-specific forms, wheat/rice/corn, 642
Agrobacterium tumefaciens
promotor expression vectors, development and use, 86
UDP-glucose glucosyltransferases, gel-electrophoresis separation, 913
Aleurone, barley, starchy endosperm proteins and, differential synthesis, 630
Algae
Chlamydomonas reinhardtii, oxygen evolution and uptake, 372
halotolerant
Dunaliella salina, ion content and ion fluxes, 92
Dunaliella salina, potassium and calcium uptake systems, 875
Phaeodactylum tricornutum, biosynthesis, *diatom light-harvesting*, *149*
Alkaloids
dopamine and, subcellular localization, *Papaver bracteatum* vacuolar compartments, 161
root culture production, hyoscyamine 6β-hydroxylase, *Hyoscyamus niger*, 619
Alternaria carthami, elicitors, parsley cell response, 216
Amino acids, transport
Nicotiana tabacum, 36
protoplasts, soybean leaves, 8
1-Aminocyclopropane-1-carboxylic acid
assay, interferences and specificity, hypochlorite reagent, 156
1-(malonylamino)cyclopropane-1-carboxylic acid conversion, plant tissues, 637
Ammonia
content, lemon leaves, arginine biosynthesis, 774
fixation, glutamine synthetase and synthase, *Cissus quadrangularis*, 356
Ammonium
chloride influences, potassium and nitrate absorption, barley roots, 67
nitrate and
light and CO_2-fixation requirements, *Anacytis nidulans*, 686
photosynthetic suppression, N-limited *Selenastrum minutum*, 273
α-Amylase, multiple forms, seeds, *Araucaria araucana* and *A. angustifolia*, 1062
Anabaena cylindrica, dinitrogen fixation, boron essentiality, 430
Anabaena variabilis, proton efflux, monochromatic light effect, 939
Anacystis nidulans
dinitrogen fixation, boron essentiality, *Anabaena cylindrica*, 430
nitrogen utilization, carbon dependence, 686
Anemia phyllitidis, aphidicolin inhibition, DNA synthesis and germination, spores, 714
Anions, tonoplast H^+-ATPase stimulation and inhibition, chloride and nitrate, beet, 120
Anthrocyanin, production, light and temperature, cabbage, 922
Aphanothece halophytica, effect of betaine on enzyme activity, ribulose-1,5-bisphosphate carboxylase/oxygenase, 1044
Aphidicolin, inhibition, DNA synthesis and spore germination, *Anemia phyllitidis*, 714
Arabidopsis thaliana
linoleic acid synthesis, 731
mutant, altered lipid unsaturation, 859
tobacco/tomato/potato and, transformation, binary Ti vector system, 301
Araucaria angustifolia, multiple forms of α-amylase, seeds, 1062
Araucaria araucana, multiple forms of α-*amylase, seeds, 1062*
Arginine, biosynthesis, during phosphorus deficiency, lemon leaves, 774
Ash, abscisic acid and indoleacetic acid, purification and measurement, high per-*formance liquid chromatography*, *997*
Aspartate, glutamate and, malate decarboxylation, corn, 115
ATP (*see* Adenosine triphosphate)
ATPase (*see* Adenosine triphosphatase)
Atriplex nummularia, hydrogen pump modulation, salinity during growth, 1050
Auxin
calcium and calmodulin antagonists, protein phosphorylation, oat coleoptiles, *836*
glycoprotein release, embryogenic carrot cells, 931
lateral redistribution, phototropism, maize coleoptiles, 306
rapid action, calcium dependence, maize roots, 439
stability, salt concentration, culture media, 934
Avena sativa (*see* Oats)
Avocado
ethylene biosynthesis, regulation during *ripening*, *130*
ripening, cellulase, synthesis and processing, 830

B

Barley
aleurone and starchy endosperm proteins, differential synthesis, 630
chloroplast proteins, biosynthesis, 60
endosperms, hydrolysis, storage proteins, 901
leaves
buffer capacities, 597
fructan metabolism, regulation, 444
membrane proteins, 2D gel electrophoresis, 802
potassium influx regulation model, negative feedback effects, plasmalemma influx, 1
protoplasts, electrofusion, calmodulin and

cytoskeleton, 1151
roots
DNP and ATP levels, NMR assessment, 1130
potassium and nitrate absorption, ammonium and chloride influences, 67
Bean
early germinal stage, *myo*-inositol from glucose, 493
in vivo acquired thermotolerance, chloroplasts, 192
iron deficiency, rhizosphere acidification, 842
nitrogen fixation, growth, 737
phytohemagglutinin oligosaccharides, Asparagine 12 and 60, 320
ribulose-1,5-bisphosphate carboxylase regulation, oxygen, light, 788
root nodules, glutamine synthetase, 142
stomatal regulation, *trans*-cinnamic and *p*-coumaric acid, 253
storage protein gene expression, developing cotyledons, 50
wheat leaves and, CO_2 compensation point and respiration, 379
Beet
1,3-β-D-glucan synthase, isolation and solubilization, 171
nicotinamide adenine dinucleotide, mitochondria responses, 587
pyrophosphatase and ATPase, separation, *higher plant tonoplast*, 126
tonoplast H^+-ATPase, stimulation and inhibition, chloride and nitrate, 120
Betaine, effect on enzyme activity, ribulose-1,5-bisphosphate carboxylase/oxygenase, *Aphanothece halophytica*, 1044
Beta vulgaris (*see* Beet)
Blueberry, short-term flooding effects, gas exchange, quantum yield, 289
Boron
calcium and, indole-3-acetic acid transport, sunflower hypocotyl segments, 651
deficient sunflower hypocotyl segments, indole-3-acetic acid transport, 646
essentiality, dinitrogen fixation, *Anabaena cylindrica*, 430
Brassica napus (*see* Rapeseed)
Brassica oleracea (*see* Cabbage)
Brown center, development, ultrastructural changes, potato pith cells, 167
Bud
developing, pea, phytochrome control of mRNA levels, 1033
grapevine, dormancy, catalase activity, 1140
Buffers, capacities, leaf cells and organelles, barley/spinach/spruce/fir, 597
Bush bean, *polyphenoloxidase in higher* plants, translation product analysis, 614

C

Cabbage, anthrocyanin production, light and temperature, 922
Cadmium, binding protein, tomato roots, 896
Calcium
amino acid transport, *Nicotiana tabacum*, 36
boron and, indole-3-acetic acid transport, sunflower hypocotyl segments, 651
calmodulin antagonists and auxin, protein phosphorylation, oat coleoptiles, 836
deficient sunflower hypocotyl segments, indole-3-acetic acid transport, 646
dependence, rapid auxin action, maize roots, 439
polar flux, hypocotyl segments, sunflower, 408
potassium and, uptake systems, *Dunaliella salina*, 875
Calcium chloride, sodium chloride and, ion activities, cotton root growth, 792
Calmodulin, cytoskeleton and, electrofusion, plant protoplasts, 1151
Calmodulin antagonist, calcium and auxin, protein phosphorylation, oat coleoptiles, 836
Calothrix parietina, dinitrogen fixation, boron essentiality, *Anabaena cylindrica*, 430
CAM plants
ammonia fixation, glutamine synthetase and synthase, *Cissus quadrangularis*, 356
respiratory CO_2, as a carbon source, high temperatures, 390
Carbohydrates
carbon distribution, kernel abortion in maize, 511
concentration patterns, acid invertase activity, kernel abortion in maize, 503
metabolism, carbon export, cotton leaf, 584
partitioning, apparent nitrogen fixation, *outdoor-grown soybeans*, 280
role, extensin structure, extended conformation, 242
soluble, induced water stress, *Sorghum bicolor*, 626
Carbon
dependence, nitrogen utilization, *Anacystis nidulans*, 686
distribution, kernel carbohydrates, kernel abortion in maize, 511
export, carbohydrate metabolism, cotton leaf, 584
nitrogen and, remobilization, soybean sink-source ratios, 136
sources
NADP-specific glutamate dehydrogenase, *Chlorella sorokiniana*, 413
respiratory CO_2, CAM plants, 390
Carbon dioxide
assimilation, C_4 metabolites and photosynthetic induction, *Flaveria trinervia*, 663
compensation point and respiration, wheat and bean leaves, 379
dark, root nodule fixation, soybean, 200
gibberellic acid and kinetin, ethylene and thermoinhibition of seed germination, lettuce, 950
high, phosphorus deficiency and drought stress, *Pinus radiata*, 423
incorporation pattern, oxygen and carboxylase, *Ulva* photosynthesis, 937
metabolism
during C_4 induction, *Flaveria trinervia*, 669
photosynthesis limitation, spinach, 1115, 1123
photosynthetic, disappearance causes, isolated spinach chloroplasts, 81
respiratory, as carbon source, CAM plants, 390
Carboxylase, activities, oxygen and CO_2 incorporation pattern, *Ulva* photosynthesis, 937
Carrot
cells, embryogenic, auxin-controlled glycoprotein release, 931
cell walls, salt-extractable extensin, cross-linking patterns, 234
expression of embryogenic program, effect of 2,4-dichlorophenoxyacetic acid, 1143
extensin structure, extended conformation, carbohydrate role, 242
protoplasts, potassium transport, suspension culture cells, 1022
Carthamus tinctorius (*see* Safflower)
Castanea sativa (*see* Chestnut)
Castor bean
seedlings
macrocyclic diterpene casbene, biosynthesis, 335
macrosynthetic diterpene casbene, biosynthesis, 343
seeds, leucoplasts, protein transport, 877
Catalase
acitivity, grapevine, bud dormancy, 1140
heterogeneity, maturing and germinated cotton seeds, 1134
Cell cycle, state I-state II transitions, stage-specific, *Euglena gracilis*, 548
Cell surfaces, plant-microorganism interactions, ethylene elicitors, melon plants, 228
Cellulase, synthesis and processing, ripening *avocado*, 830
Cell wall
carbohydrate role, extensin structure, extended conformation, 242
carrot, salt-extractable extensin, cross-linking patterns, 234
fragments, ethylene production, pear cells, 929
glucans and lipids, UDP-glucose incorporation, cotton fibers, 464
Chara corallina
membrane electrical noise, low frequency spectral component, inhibitors, 758
membrane impedance, Laplace transforms analysis, 919
proton pumping, inhibitors, 55
Chestnut, germinating seeds and seedlings, amino acid content, 692
Chilling
fatty acid composition of higher plants, phosphatidylglycerol, sulfoquinovosyldiacylglycerol, 946
sensitive plants, phase transitions, mitochondria, 807
Chitinase, activity, ethylene elicitors, melon plants, 228
Chlamydomonas eugametos, mating process, cellular interactions, 522
Chlamydomonas reinhardtii
oxygen evolution and uptake, 372
precursor processing, ribulose biphosphate carboxylase, 702
Chlorella pyrenoidosa, photosystem II, cyclic electron flow, 310
Chlorella sorokiniana
cytosolic precursor-protein, glutamate dehydrogenase, chloroplastic localization, 349
glutamate dehydrogenase mRNA, ammonium-inducible, purification, 527
NADP-specific glutamate dehydrogenase, different forms, 413

Chloride
ammonium influences, potassium and nitrate absorption, barley roots, 67
nitrate and, tonoplast H^+-ATPase stimulation and inhibition, beet, 120
Chlorophyll *a*
fluorescence and growth responses, phosphorus deficiency/drought stress/high CO_2, *Pinus radiata*, 423
P700 protein complex, cytochrome b_6/f, biosynthesis, 60
Chlorophyll *b*, deficiency, temperature-sensitive mutant, sweetclover, 329
Chloroplasts
broken, light dependent reduction of pertechnetate, spinach, 1003
corn, malate decarboxylation, aspartate and glutamate roles, 115
DNA, microspectrofluorometric measurement, spinach leaf cells, 708
in vivo acquired thermotolerance, bean, 192
localization, glutamate dehyrogenase, *Chlorella sorokiniana*, 349
pea
stroma, neural peptidases, 603
synthesis of a putative *c*-type cytochrome, 960
phosphoglucose isomerase, enzyme activity and starch level, *Clarkia xantiana*, 367
proteins, biosynthesis, 60
redifferentiation from chromoplasts, Osbeck fruit, epicarp, 30
spinach, photosynthetic CO_2 fixation, disappearance causes, 81
Choline, ethanolamine and, uptake, *Lemna paucicostata*, 285
Chorismate mutase, isoenzyme comparisons with other plants, *Sorghum bicolor*, 717
Chromatin, maize-shoot, protein-synthesizing activity, 404
Chromophores, phytochrome apoprotein synthesis, Alaska pea, 1014
Chromoplasts, reversion to chloroplasts, Osbeck fruit, epicarp, 30
trans-Cinnamic acid, stomatal regulation, beans and corn, 253
Cissus quadrangularis, CAM plant, ammonia fixation, glutamine synthetase and synthase, 356
Citrus latifolia (*see* Lime)
Citrus limon (*see* Lemon)
Citrus paradisi (*see* Grapefruit)
Citrus sinensis (*see* Osbeck fruit)
Cladosporium cucumerinum, elicitors, parsley cell response, 216
Clarkia xantiana, enzyme activity and starch level, induced mutant, chloroplast phosphoglucose isomerase, 367
Clover, nodulation stimulation, penicillin and mecillinam, 326
Coleoptiles
maize, phototropism, lateral auxin redistribution, 306
oat, protein phosphorylation, 836
Colletotrichum lagenarium, ethylene elicitors, chitinase activity, melon plants, 228
Compartmentation, sodium transport and, *Spergularia marina*, 742
Cormels, *Gladiolus X gandavensis*
glucose uptake, dormancy effect, 268
heat shock response, dormancy effect, 259
Corn
ADP-glucose pyrophosphorylase, tissue-specific forms, 642
coleoptiles, phototropism, lateral auxin redistribution, 306
glutamate synthesis, isolated mitochondria, 754
hemes, synthesized from glutamate, 965
induced kernel abortion
carbohydrate concentration patterns, acid invertase activity, 503
carbon distribution among kernel carbohydrates, 511
isolated bundle sheath chloroplasts, malate decarboxylation, aspartate and glutamate, 115
leaf
adenylate kinase, purification and partial characterization, 1110
chilled, abscisic acid metabolism and mefluidide, 699
effector sensitivity, phosphoenolpyruvate carboxylase, 674
pyrophosphate:fructose 6-phosphate phosphotransferase distribution, 12
maize-shoot chromatin, protein-synthesizing activity, 404
oats and, phytochrome-controlled elongation, photobiology, 533
proline-rich zein, cDNA, primary structure, 70
roots
electrogenic exchanges, hydrogen and potassium, 847
H^+-ATPase, vanadate-sensitive, 542
indol-3yl-acetic acid, saturable uptake, 889
proteases, inhibitors, 869
rapid auxin action, calcium dependence, 439
sodium uptake, nuclear magnetic resonance, 925
stomatal regulation, *trans*-cinnamic and *p*-coumaric acid, 253
Cotton
abscisic acid and indoleacetic acid, purification and measurement, high performance liquid chromatography, 997
cotyledons, abscising, phenylacetic acid, 434
fibers, UDP-glucose incorporation, cell wall glucans and lipids, 464
leaf, carbon export, carbohydrate metabolism, 584
potassium and membrane potential development, salinity resistance, 1057
root growth, sodium chloride and calcium chloride, ion activities, 792
seeds, maturing and germinated, catalase heterogeneity, 1134
Cotyledons
cotton, abscising, phenylacetic acid, 434
developing, storage protein gene expression, *Phaseolus vulgaris*, 50
pea, identification of gibberellins, aldehyde metabolism, 984
pumpkin, glyoxysomes to leaf peroxisomes, during greening, 313
p-Coumaric acid, stomatal regulation, beans and corn, 253
Cowpea
nodules
mitochondria, metabolism under microaerobic conditions, 1097
preparation and properties of mitochondria, 1092
root respiration, nitrate assimilation, 972
C_4 plants
glycerate kinase role, thiol-dependent regulation, leaf extracts, 656
photosynthesis induction, *Flaveria trinervia*, 663, 669
Crassulacean acid metabolism
CAM plants, respiratory CO_2 as a carbon source, 390
leaf water potential, *Sedum rubrotinctum*, 678
Cucumber
acifluorfen action, photosynthesis, 882
malate synthase, gene expression, 762
Cucumis melo (*see* Melon)
Cucumis sativus (*see* Cucumber)
Cucurbita (*see* Pumpkin)
Culture media, auxin stability, salt concentration, 934
Cystathionine, threonine and, phosphate and adenosine monophosphate effects, *Lemna paucicostata*, 577
Cytochrome, *c*-type, synthesis, pea chloroplasts, 960
Cytochrome b_6/f, P700-chlorophyll *a* and, biosynthesis, 60
Cytokinin
activity, thidiazuron induction, radish, 681
changes following root infection, *Eucalyptus marginata*, 1103
Cytoplasm, diatom light-harvesting complex, biosynthesis, 149
Cytoskeleton, calmodulin and, electrofusion, plant protoplasts, 1151
Cytosol, precursor-protein, glutamate dehydrogenase and chloroplastic localization, *Chlorella sorokiniana*, 349

D

Daucus carota (*see* Carrot)
Deoxyribonucleic acid
chloroplast, microspectrofluorometric measurement, spinach leaf cells, 708
full length double-stranded, synthesis, purified glutamate dehydrogenase mRNA of *Chlorella sorokiniana*, 527
molecular cloning, enzyme synthesis, glyoxysomal malate synthase of cucumber, 762
primary structure, proline-rich zein, 70
synthesis and spore germination, aphidicolin inhibition, *Anemia phyllitidis*, 714
Detergent solubilization, thylakoid membranes, low temperature development, winter rye leaves, 471
Dianthus chinensis, hexokinase activity, developing leaves, 186
Diatom, light-harvesting complex, biosynthesis, 149
2,4-Dichlorophenoxyacetic acid, expression of embryogenic program, carrot, 1143
Dihydrozeatinriboside, *trans*-zeatin riboside and, monoclonal antibodies, *Lycopersicon esculentum*, 516
2,4-Dinitrophenol, ATP levels and, nuclear magnetic resonance assessment, barley roots, 1130
Diterpene casbene, macrocyclic, biosynthesis, castor bean seedlings, 335, 343
DNA (*see* Deoxyribonucleic acid)
Dopamine, alkaloids and, subcellular localization, *Papaver bracteatum* vacuolar

compartments, 161
Dormancy, *Gladiolus X gandavensis* cormels
glucose uptake, 268
heat shock response, 259
Dunaliella salina, halotolerant
ion content and ion fluxes, determination, 92
potassium and calcium uptake systems, 875

E

Effectors, sensitivity, maize leaf, phosphoenolpyruvate carboxylase, 674
Electrical noise, membrane, low frequency spectral component, *Chara corallina*, 758
Electrofusion, calmodulin and cytoskeleton involvement, plant protoplasts, 1151
Electrogenic exchanges, hydrogen and potassium, corn roots, 847
Electrophoresis
free-flow, plasma membrane and tonoplast isolation, soybean hypocotyls, 177
gel, UDP-glucose glucosyltransferases, *Agrobacterium tumefaciens* and *Acetobacter xylinum*, 913
two-dimensional gel, membrane proteins, barley, 802
Elicitors
ethylene, *Colletotrichum lagenarium*, chitinase activity, 228
parsley cell response, phytopathogenic fungi, 216
Embryogenesis, effect of 2,4-dichlorophenoxyacetic acid, carrot, 1143
Endosperm
barley, hydrolysis, storage proteins, 901
developing castor oil seeds, leucoplasts, protein transport, 877
starchy proteins and barley aleurone, differential synthesis, 630
wheat, starch synthase, heat inactivation, 448
Enzymes, α,α-trehalose metabolism, soybean nodules, 538
Epicarp, Osbeck fruit, reversion of chromoplasts to chloroplasts, 30
Escherichia coli, promotor expression vectors, development and use, 86
Ethanolamine, choline and, uptake, *Lemna paucicostata*, 285
Ethylene
1-aminocyclopropane-1-carboxylic acid assay, hypochlorite reagent, 156
biosynthesis, regulation during ripening, avocado, 130
elicitors, chitinase activity, melon plants, 228
production, cell wall fragments, pear cells, 929
role, germination, lettuce seed, 780
thermoinhibition of seed germination, gibberellic acid/kinetin/CO_2, lettuce, 950
Etiochloroplasts, wheat, photosystem I polypeptide, synthesis, 705
Eucalyptus marginata, cytokinin changes, root infection by *Phytophthora cinnamomi*, 1103
Euglena gracilis, cell cycle, state I-state II transitions, stage-specific, 548
Euphorbia esula, latex starch utilization, 696
Extensin
salt-extractable, cross-linking patterns, carrot cell walls, 234
structure, carbohydrate role, extended conformation, 242

F

Farnesyl transferase, macrocyclic diterpene casbene, biosynthesis, castor bean seedlings, 343
Fatty acids, phosphatidylglycerol and sulfoquinovosyldiacylglycerol, chilling sensitivity, higher plants, 946
Fir, needles, buffer capacities, 597
Flaveria linearis, apparent photosynthesis, oxygen stimulation, 212
Flaveria trinervia photosynthetic induction
C_4 metabolites, 663
carbon dioxide metabolism, during C_4 induction, 669
Flooding, short-term effects, gas exchange and quantum yield, blueberry, 289
Flower, induction, lime, water stress and low temperature effects, 26
Fraxinus uhdei (*see* Ash)
Fructan, metabolism, regulation, barley leaves, 444
Fungi, phytopathogenic, elicitors, parsley cell response, 216

G

Gabaculine, phytochrome apoprotein and chromophore synthesis, Alaska pea, 1014
Gas exchange, quantum yield and, short-term flooding effects, blueberry, 289
Geranium, comparative phloem mobility, nickel, 689
Germination
early stages, *myo*-inositol from glucose, bean, 493
enzyme synthesis, glyoxysomal malate synthase, cucumber, 762
ethylene role, lettuce seed, 780
spore, DNA synthesis, aphidicolin inhibition in *Anemia phyllitidis*, 714
Gibberellic acid, kinetin and CO_2, ethylene and thermoinhibition of seed germination, lettuce, 950
Gibberellins
aldehyde metabolism, photoperiod modification, pea shoots, 991
identification, aldehyde metabolism, pea, 984
Gladiolus X gandavensis
cormels
glucose uptake, dormancy effect, 268
heat shock response, dormancy effect, 259
1,3-β-D-Glucan synthase, isolation and solubilization, sugar beet, 171
Glucans, lipids and, UDP-glucose incorporation, cotton fibers, 464
Glucose
myo-inositol synthesis, early germinal stages, bean, 493
uptake, *Gladiolus X gandavensis* cormels, dormancy effect, 268
Glucosyltransferases, UDP-glucose, gel-electrophoretic separation, *Agrobacterium tumefaciens* and *Acetobacter xylinum*, 913
Glutamate
aspartate and, malate decarboxylation, corn, 115
biosynthesis of protoheme and heme *a*, maize, 965
synthesis, isolated mitochondria, pea and corn shoots, 754
Glutamate dehydrogenase
cytosolic precursor-protein, chloroplastic localization, *Chlorella sorokiniana*, 349
mRNA, full length cDNA synthesis, *Chlorella sorokiniana*, 527
NADP-specific, carbon sources, *Chlorella sorokiniana*, 413
Glutamine synthetase
glutamine synthase and, ammonia fixation, *Cissus quadrangularis*, 356
isozymes, root nodules, common bean and lima bean, 142
Glutelin, polypeptides, structural relationship, rice, 748
Glycerate kinase, metabolism, thiol-dependent regulation, leaf extracts, 656
Glycerolipids, soybean, water stress response, 798
Glycine max (*see* Soybean)
Glycoproteins
oligosaccharide side chains, high-mannose form, glycosidases, 206
processing, mannosidase I, mung bean seedlings, 383
release, auxin-controlled, embryogenic carrot cells, 931
Glycosidases, glycoproteins, high-mannose form, oligosaccharide side chains, 206
Glyoxysomes, transformation to leaf peroxisomes, during greening, pumpkin cotyledons, 313
Golgi membrane system, H^+-translocating ATPase, sycamore, 222
Gossypium hirsutum (*see* Cotton)
Grapefruit, abscisic acid and indoleacetic acid, purification and measurement, high performance liquid chromatography, 997
Grapevine, dormancy, catalase activity, 1140
Growth, carbohydrate level and, effect of irradiance and temperature, tomato, 1075
Growth regulators, monoclonal antibodies, *Lycopersicon esculentum*, 516
Growth responses, phytochrome-mediated, photobiology, oats and corn, 533
Guard cells, abscisic acid accumulation, water stress, *Pisum sativum* and *Vicia faba*, 1017
Guayule plants, rubber production potential, 1027

H

Heat, inactivation, starch synthase, wheat endosperm tissue, 448
Heat stress
in vivo acquired thermotolerance, chloroplasts, bean, 192
shock response, *Gladiolus X gandavensis*, dormancy effect, 259
Hedera helix, leaves, light and drought stress, stomatal responses, 768
Helianthus annuus (*see* Sunflower)
Hemes, corn, synthesized from glutamate, 965
Hexokinase, activity, developing leaves, *Dianthus chinensis*, 186
Hordeum vulgare (*see* Barley)
Hydrogen, potassium and, electrogenic ex-

changes, corn roots, 847
Hydrogen pump, modulation, salinity during growth, *Atriplex nummularia*, 1050
Hydrolysis, storage proteins, barley endosperms, 901
Hyoscyamus niger, root cultures, alkaloid-producing, hyoscyamine 6β-hydroxylase, 619
Hypochlorite, reagent, 1-aminocyclopropane-1-carboxylic acid assay, 156
Hypocotyls
phototropism
growth inhibitor isolation, radish, 976
role of *cis*- and *trans*-raphanusanins and raphanusamide, 980
soybean, plasma membrane and tonoplast isolation, 177
Hypocotyl segments
sunflower
boron- and calcium-deficient, indole-3-acetic acid transport, 646, 651
polar calcium flux, 408

I

IAA (*see* Indole-3-acetic acid)
Indole-3-acetic acid
abscisic acid and, purification and measurements, 997
transport
boron and calcium, sunflower hypocotyl segments, 651
sunflower hypocotyl segments, boron and calcium deficiency, 646
Indol-3yl-acetic acid, saturable uptake, maize roots, 889
myo-Inositol, from glucose, early germinal stages, bean, 493
Ions, fluxes, content determination, halotolerant *Dunaliella salina*, 92
Iron
deficiency, rhizosphere acidification, bean, 842
sulfur and, clusters, aconitase and potato mitochondria, 247
Irradiance, effect of temperature and, carbohydrate level and growth, tomato, 1075
Isoenzymes, chorismate mutase, comparison with other plants, *Sorghum bicolor*, 717

K

Kalanchoë blossfeldiana, malate metabolism, leaf mitochondria, 1039
Kalanchoë daigremontiana
quantum yields, photosynthetic O_2 exchange, 297
respiratory CO_2, as a carbon source, CAM plants, 390
Kernel, maize
induced abortion, carbohydrate concentration patterns and acid invertase activity, 503
induced abortion, carbohydrate carbon distribution, 511
Kinetin, gibberellic acid and CO_2, ethylene and thermoinhibition of seed germination, lettuce, 950

L

Lactuca sativa (*see* Lettuce)
Laplace transforms, analysis, membrane impedance, *Chara corallina*, 919
Latex starch, utilization, *Euphorbia esula*, 696
Leaf
Arabidopsis thaliana lipids, altered unsaturation, 859
barley, fructan metabolism, regulation, 444
barley and spinach, buffer capacities, 597
corn
adenylate kinase, purification and partial characterization, 1110
chilled, abscisic acid metabolism and mefluidide treatment, 699
cotton, carbon export, carbohydrate metabolism, 584
Dianthus chinensis, hexokinase activity, 186
Euphorbia esula, latex starch utilization, 696
extracts, glycerate metabolism, thiol-dependent regulation, 656
flag, postanthesis nitrate assimilation, winter wheat, 17
Flaveria trinervia, CO_2 assimilation and C_4 metabolites, 663
Hedera helix, light and drought stress, stomatal responses, 768
Kalanchoë blossfeldiana, mitochondria, malate metabolism, 1039
lemon, ammonia content, arginine biosynthesis, 774
maize
effector sensitivity, phosphoenolpyruvate carboxylase, 674
pyrophosphate:fructose 6-phosphate phosphotransferase distribution, 12
pumpkin cotyledons, peroxisome transformation by glyoxysomes, 313
rapid sampler, psychometric measurements, 684
Sedum rubrotinctum, water potential and crassulacean acid metabolism, response to prolonged drought, 678
Sorghum bicolor, prephenate aminotransferase localization, 711
soybean
amino acid transport, protoplasts, 8
ribulose biphosphate carboxylase, purification and degradation, 97
spinach
barley and, buffer capacities, 597
division and expansion, chloroplast DNA, 708
leu-proteinase, purification and characterization, 872
wheat, acid carboxypeptidases, 823
winter rye, low temperature development, detergent solubilization of thylakoid membranes, 471
winter wheat, postanthesis nitrate assimilation, 17
Lectin, positive and negative soybean varieties, related proteins in seeds and roots, 558
Legumes, nodulated, detecting ureide synthesis, two indirect methods, 566
Lemna paucicostata
metabolism, methionine methyl group, 103
phosphate and adenosine monophosphate effects, threonine and cystathionine, 577
uptake, choline and ethanolamine, 285
Lemon, leaves, ammonia content, arginine biosynthesis, 774
Lettuce
polyphenoloxidase in higher plants, translation product analysis, 614
seed germination
ethylene role, 780
thermoinhibition, ethylene synthesis, 950
L-Leucine, transport, *Nicotiana tabacum*, 36
Leucoplasts, protein transport, developing castor oil seeds, 877
Leu-proteinase, purification and characterization, spinach leaves, 872
Light
axial gradient, photomorphogenesis, emerging corn seedlings, 75
dark transitions and, phosphoenolpyruvate carboxylase, effector sensitivity of maize leaf, 674
drought stress and, stomatal responses, *Hedera helix*, 768
induced absorbance changes, *Trichoderma* mutants, 726
modulation, nucleoside triphosphatase activity, pea nuclei, 609
monochromatic, proton efflux, *Anabaena variabilis*, 939
NADP-specific glutamate dehydrogenase, carbon sources, *Chlorella sorokiniana*, 413
oxygen and, ribulose-1,5-bisphosphate carboxylase regulation, bean, 788
requirements, nitrate and ammonium utilization, *Anacystis nidulans*, 686
temperature and, anthrocyanin production, cabbage, 922
vapor pressure difference and, stromatal response, soybean and sugarcane, 865
Light-harvesting complex
diatom, biosynthesis, 149
stage-specific cell cycle, state I-state II transitions, *Euglena gracilis*, 548
Lima bean, root nodules, glutamine synthetase, 142
Lime, flower induction, water stress, temperature effects, 26
Linoleic acid
oleic acid metabolism comparison, soybean, 41
synthesis, *Arabidopsis thaliana*, 731
Lipids
altered unsaturation, mutant *Arabidopsis thaliana*, 859
glucans and, UDP-glucose incorporation, cotton fibers, 464
polar, phase transitions and mitochondria, chilling-sensitive plants, 807
Liposomes, phase transitions, mitochondria, chilling-sensitive plants, 807
Lycopersicon esculentum (*see* Tomato)

M

Maize (*see* Corn)
Malate
decarboxylation, aspartate and glutamate roles, corn, 115
metabolism, leaf mitochondria, *Kalanchoe blossfeldiana*, 1039
Malate synthase, gene expression, enzyme synthesis, cucumber, 762
1-(Malonylamino)cyclopropane-1-carboxylicacid, conversion to 1-aminocyclopropane-1-carboxylic acid, plant tissues, 637

Mamillaria woodsii, respiratory CO_2, as a carbon source, CAM plants, 390
Mannose, high
glycosidases, glycoprotein side chains, 206
phytohemagglutinin oligosaccharides, Asparagine 12 and 60, 320
α-Mannosidase I, glycoprotein processing, mung bean seedlings, 383
Mating process, cellular interactions, *Chlamydomonas eugametos*, 522
Mecillinam, penicillin and, nodulation stimulation, clover, 326
Mefluidide, treatment, abscisic acid metabolism, chilled corn leaves, 699
Melilotus alba (*see* Sweetclover)
Melon, ethylene elicitors, *Colletotrichum lagenarium*, chitinase activity, 228
Membrane
electrical noise, low frequency spectral component, *Chara corallina*, 758
impedance, Laplace transforms analysis, *Chara corallina*, 919
potential, potassium promotion and cotton root vesicles, 1057
proteins, solubilization, barley 2D gel electrophoresis, 802
senescence, ripening tomato fruit, 954
vesicles, H^+-ATPase and corn roots, 542
Mesophyll cells, protoplasts, amino acid transport, soybean leaves, 8
Metal, reactions of ribulosebisphosphate carboxylase/oxygenase, substrate specificity determinants, 943
Methionine methyl, metabolism, *Lemna paucicostata*, 103
Microcystis aeruginosa, dinitrogen fixation, boron essentiality, *Anabaena cylindrica*, 430
Microspectrofluorometry, spinach, leaf cell division and expansion, chloroplast DNA, 708
Mitochondria
isolated, glutamate synthesis, pea and corn shoots, 754
leaf, malate metabolism, *Kalanchoë blossfeldiana*, 1039
nicotinamide adenine dinucleotide, beet and turnip, 587
phase transitions, polar lipids, chilling-sensitive plants, 807
potato, iron-sulfur clusters, aconitase, 247
preparation and properties, cowpea nodules, 1092
under microaerobic conditions, cowpea nodules, 1097
Monoclonal antibodies
immunological comparisons, nitrate reductases, different plant species, 376
plant growth regulators, tomato, 516
Monogalactosyldiacylglycerol, unsaturated, linoleic acid synthesis, *Arabidopsis thaliana*, 731
Morus alba (*see* Mulberry)
Mulberry, abscisic acid and indoleacetic acid, purification and measurement, high performance liquid chromatography, 997
Mung bean
polyphenoloxidase in higher plants, translation product analysis, 614
seedling
N-acetylglucosamine, purification and properties, 1086
glycoprotein processing, mannosidase I, 383

N

NADH:Nitrate reductase, lack, soybean mutants, biochemical characterization, 593
NADP, glutamate dehydrogenase, different forms, *Chlorella sorokiniana*, 413
Needle, spruce and fir, buffer capacities, 597
Nickel, comparative phloem mobility, geranium and pea, 689
Nicotiana glauca (*see* Tobacco)
Nicotiana gossii (*see* Tobacco)
Nicotiana plubaginifolia (*see* Tobacco)
Nicotiana rustica (*see* Tobacco)
Nicotiana tabacum (*see* Tobacco)
Nicotinamide adenine dinucleotide, mitochondria responses, beet and turnip, 587
Nitrate
ammonium and
light and CO_2-fixation requirements, *Anacystis nidulans*, 686
photosynthetic suppression, N-limited *Selenastrum minutum*, 273
assimilation, root respiration, cowpea, 972
chloride and, tonoplast H^+-ATPase stimulation and inhibition, beet, 120
postanthesis assimilation, flat leaf reduction, winter wheat, 17
potassium absorption, ammonium and chloride influences, barley roots, 67
Nitrate reductase
deficiency, soybean mutants, characterization, 572
immunological comparisons, monoclonal antibodies, different plant species, 376
NADH lack, soybean mutants, biochemical characterization, 593
primary roots, red spruce seedlings, 723
Nitrogen
apparent fixation, carbohydrate partitioning, outdoor-grown soybeans, 280
carbon and, remobilization, soybean sink-source ratios, 136
fixation
boron essentiality, *Anabaena cylindrica*, 430
nitrogen dioxide and growth, bean, 737
utilization, carbon dependence, *Anacystis nidulans*, 686
Nodules
cowpea
mitochondria, metabolism under microaerobic conditions, 1097
preparation and properties of mitochondria, 1092
soybean
α,α-trehalose metabolism, enzymes, 538
serine hydroxymethyltransferase, 553
stimulation, penicillin and mecillinam, clover, 326
Nopaline synthase, transformed tobacco cells, promotor expression vector, development and use, 86
Nostoc muscorum, dinitrogen fixation, boron essentiality, *Anabaena cylindrica*, 430
Nuclear magnetic resonance
DNP and ATP levels, barley roots, 1130
sodium uptake, corn root, 925
Nucleoside triphosphatase, light modulation, pea nuclei, 609

O

Oats
coleoptiles, protein phosphorylation, 836
corn and, phytochrome-controlled elongation, photobiology, 533
oxygen evolution, single protoplasts, 854
roots, tonoplast vesicles, electrogenic H^+-pumping pyrophosphatase, 497
Oleic acid, metabolism, comparison, soybean, 41
Oligosaccharides
glycoprotein side chains, high-mannose form, glycosidases, 206
high mannose, phytohemagglutinin, Asparagine 12 and 60, 320
Opuntia vulgaris, respiratory CO_2, as a carbon source, CAM plants, 390
Organic acids, soluble carbohydrates and, induced water stress, *Sorghum bicolor*, 626
Oryza sativa (*see* Rice)
Osbeck fruit, epicarp, reversion of chromoplasts to chloroplasts, 30
Osmoticum, high, embryo development, rapeseed, 907
Ovary, growth, anthesis to abscission, soybean, 1069
Oxygen
evolution, single protoplasts, *Avena sativa*, 854
evolution and uptake, *Chlamydomonas reinhardtii*, 372
exchange, quantum yields, CAM plants, 297
light and, ribulose-1,5-bisphosphate carboxylase regulation, bean, 788
stimulation, apparent photosynthesis, *Flaveria linearis*, 212
Ulva photosynthesis, carboxylase activities and CO_2 incorporation pattern, 937

P

Panicum boliviense, compared to *Flaveria linearis*, apparent photosynthesis, oxygen stimulation, 212
Papaver bracteatum, vacuolar compartments, alkaloids and dopamine, subcellular localization, 161
Parsley, response to elicitors, phytopathogenic fungi, 216
Parthenium argentatum (*see* Guayule plants)
Pea
abscisic acid accumulation, isolated guard cells, water stress, 1017
chloroplasts
proteins, biosynthesis, 60
stroma, neural peptidases, 603
synthesis of a putative *c*-type cytochrome, 960
comparative phloem mobility, nickel, 689
glutamate synthesis, isolated mitochondria, 754
identification of gibberellins, aldehyde metabolism, 984
nuclei, light modulation, nucleoside triphosphatase acitivity, 609
phytochrome apoprotein and chromophore synthesis, 1014
phytochrome control, mRNA levels, developing buds, 1033
polyphenoloxidase in higher plants, translation product analysis, 614
ribulose-1,5-bisphosphate carboxylase, protein transport, castor bean leucoplasts, 877
shoots, photoperiod modification, GA_{12} aldehyde metabolism, 991

Pear, cells, ethylene induction, cell wall fragments, 929
Pea sativum (*see* Pea)
Pelargonium zonale (*see* Geranium)
Penicillin, mecillinam and, nodulation stimulation, clover, 326
Peptidases, neural, stroma, pea chloroplasts, 603
Pericarp tissue, tomato, gene expression changes, during ripening, 395
Peroxidase, anionic, suberization, wound-healing potato tuber tissue, 487
Peroxisomes, leaf, transformation by glyoxysomes, pumpkin cotyledons, 313
Persea americana (*see* Avocado)
Pertechnetate, light dependent reduction, broken chloroplasts, spinach, 1003
Petroselinum crispum (*see* Parsley)
PFP^3 (*see* Pyrophosphate:fructose 6-phosphate)
pH, buffers, amino acid transport, tobacco, 36
Phaeodactylum tricornutum, biosynthesis, diatom light-harvesting, 149
Phaseolin, storage protein gene expression, developing cotyledons, bean, 50
Phaseolus coccineus, oxygen evolution, single protoplasts, 854
Phaseolus lunatus (*see* Bush bean; Lima bean)
Phaseolus vulgaris (*see* Bean)
Phenylacetic acid, abscission, cotton cotyledons, 434
Phloem
  comparative mobility, nickel, geranium and pea, 689
  unloading, sucrose transport and, *Vicia faba* stem, 482
Phosphate, adenosine monophosphate effect and, threonine and cystathionine, *Lemna paucicostata*, 577
Phosphatidylglycerol, sulfoquinovosyldiacylglycerol and, fatty acid composition, chilling sensitivity, 946
Phosphoenolpyruvate carboxylase, during light/dark transitions, effector sensitivity, maize leaf, 674
Phosphoglucose isomerase, chloroplast, enzyme and starch levels, *Clarkia xantiana*, 367
Phosphorus deficiency
  arginine biosynthesis, lemon leaves, 774
  drought stress and high CO_2, *Pinus radiata*, 423
Phosphoserine aminotransferase, root nodules, soybean, 293
Photomorphogenesis, axial light gradient, maize seedlings, 75
Photons, fluence rate, oxygen evolution and uptake, *Chlamydomonas reinhardtii*, 372
Photosynthesis
  acifluorfen activity, cucumber, 882
  apparent, oxygen stimulation, *Flaveria linearis*, 212
  carbon metabolism limitation
    excess electron transport capacity, spinach, 1115
    limited triose phosphate utilization, spinach, 1123
  growth responses and, chlorophyll *a* fluorescence, *Pinus radiata*, 423
  induction
    carbon dioxide metabolism, *Flaveria trinervia*, 669
    C_4 metabolites, *Flaveria trinervia*, 663
  suppression, N-limited *Selenastrum minutum*, nitrate and ammonium, 273
  Ulva, oxygen, carboxylase activities and CO_2 incorporation pattern, 937
Photosystem I, polypeptide synthesis, wheat etiochloroplasts, 705
Photosystem II, *Chlorella pyrenoidosa*, cyclic electron flow, 310
Phototropism
  lateral auxin redistribution, maize coleoptiles, 306
  radish hypocotyls
    growth inhibitor isolation, 976
    role of *cis*- and *trans*-raphanusanins and raphanusamide, 980
Phytochrome
  apoprotein synthesis, chromophore, Alaska pea, 1014
  controlled elongation, photobiology, oats and corn, 533
  control of mRNA levels, developing pea buds, 1033
Phytohemagglutinin
  oligosaccharides, Asparagine 12 and 60, 320
  storage protein gene expression, developing cotyledons, *Phaseolus vulgaris*, 50
Phytophthora cinnamomi, *Eucalyptus marginata* root infection, cytokinin changes, 1103
Phytophthora infestans, elicitors, parsley cell response, 216
Phytophthora megasperma, elicitors, parsley cell response, 216
Phytophthora parasitica, elicitors, parsley cell response, 216
Picea glauca (*see* White spruce)
Picea rubens (*see* Red spruce)
Pinus radiata, chlorophyll *a* fluorescence and growth responses, phosphorus deficiency, drought stress and high CO_2, 423
Pisum sativum (*see* Pea)
Pith cells, potato, brown center development, ultrastructural changes, 167
Plasmalemma, influx, negative feedback effects, potassium influx regulation model, 1
Plasma membrane
  ATPase, tomato root, 1080
  tonoplast isolation and, soybean hypocotyls, 177
Plastids, synthesis of a putative *c*-type cytochrome, pea chloroplasts, 960
Plastocyanin, chloroplast proteins, biosynthesis, 60
Plumbago zeylanica, pollen, sperm cell isolation, 317
Pollen, sperm cell isolation, *Plumbago zeylanica*, 317
Polyphenoloxidase, in higher plants, translation product analysis, 614
Potassium
  calcium and, uptake systems, *Dunaliella salina*, 875
  hydrogen and, electrogenic exchanges, corn roots, 847
  ion content and ion fluxes, halotolerant *Dunaliella salina*, 92
  nitrate absorption, ammonium and chloride influences, barley roots, 67
  promotion of membrane potential development, cotton root vesicles, 1057
  regulation model, negative feedback effects, plasmalemma influx, 1
  transport, carrot protoplasts, suspension culture cells, 1022
Potato
  mitochondria, iron-sulfur clusters, aconitase, 247
  pith cells, ultrastructural changes, during brown center development, 167
  tobacco/tomato/*Arabidopsis thaliana* and, transformation, binary Ti vector system, 301
  wound-healing, suberization, anionic peroxidase, 487
Prephenate aminotransferase, localization, *Sorghum bicolor* leaves, 711
Proteases, inhibitors, corn root, 869
Protein
  abnormal, rapid degradation, *Acer pseudoplatanus* vacuoles, 460
  cadmium-binding, tomato roots, 896
  membrane, solubilization, barley 2D gel electrophoresis, 802
  phosphorylation, oat coleoptiles, 836
  seeds and roots, lectin-positive and -negative soybean varieties, 558
  storage, rice, glutelin polypeptides, 748
  synthesis, chromatin, maize, 404
  transport, leucoplasts, castor oil seeds, 877
Proton
  efflux, monochromatic light effect, *Anabaena variabilis*, 939
  fluxes, external salinity response, tobacco cell lines, 454
  pumping, inhibitors, *Chara corallina*, 55
Protoplasts
  barley, electrofusion, calmodulin and cytoskeleton, 1151
  carrot, potassium transport, suspension culture cells, 1022
  Phaseolus coccineus/Avena sativa/tobacco, oxygen evolution, 854
  soybean leaves, amino acid transport, 8
Pumpkin, cotyledons, glyoxysomes to leaf peroxisomes, during greening, 313
Pyrophosphatase
  ATPase and, separation of tonoplast, beet, 126
  electrogenic H^+-pumping, tonoplast vesicles, oat roots, 497
Pyrophosphate:fructose 6-phosphate, distribution, maize leaves, 12

R

Radish
  cytokinin activity, thidiazuron induction, 681
  phototropism in hypocotyls, role of *cis*- and *trans*-raphanusanins and raphanusamide, 980
  phototropism in hypocotyls, growth inhibitor isolation, 976
Rapeseed, embryo development, high osmoticum, seed similarity, 907
Raphanusamide, phototropism in radish hypocotyls, 976, 980
cis-Raphanusanins, phototropism in radish hypocotyls, 976, 980
Raphanus sativus (*see* Radish)
Red beet, vacuoles, electrical noise measurements, ATPase activity, 1147
Red spruce, seedlings, nitrate reductase, primary roots, 723
Respiration
  CO_2 compensation point, wheat and bean

leaves, 379
root
nitrate assimilation, cowpea, 972
white spruce seedling, morphology and environment relation, 21
Rhizobium trifolii (*see* Clover)
Rhizopus stolonifer, macrocyclic diterpene casbene, biosynthesis, castor bean seedlings, 335
Rhizosphere, acidification, iron deficiency, bean, 842
Ribonucleic acid
glutamate dehydrogenase, full length cDNA synthesis, *Chlorella sorokiniana*, 527
phytochrome control, developing pea buds, 1033
storage protein gene expression, developing cotyledons, *Phaseolus vulgaris*, 50
Ribulose-1,5-bisphosphate carboxylase
effect of betaine on enzyme activity, *Aphanothece halophytica*, 1044
leucoplasts, protein transport, developing castor oil seeds, 877
precursor processing, *Chlamydomonas reinhardtii*, 702
purification and degradation, soybean leaves, 97
regulation, oxygen and light, bean, 788
role of metal, substrate specificity determinants, 943
Rice
ADP-glucose pyrophosphorylase, tissue-specific forms, 642
glutelin polypeptides, structural relationship, 748
Ricinus communis (*see* Castor bean)
Ripening
avocado, ethylene biosynthesis regulation, 130
tomato
gene expression changes, 395
membrane senescence, 954
RNA (*see* Ribonucleic acid)
Root
alkaloid-producing cultures, hyoscyamine 6β-hydroxylase, 619
barley
DNP and ATP levels, NMR assessment, 1130
potassium and nitrate absorption, ammonium and chloride influences, 67
potassium influx regulation model, 1
corn
electrogenic exchanges, hydrogen and potassium, 847
indol-3yl-acetic acid, saturable uptake, 889
membrane vesicles, vanadate-sensitive H^+-ATPase, 542
proteases, inhibitors, 869
rapid auxin action, calcium dependence, 439
sodium uptake, nuclear magnetic resonance, 925
cotton, growth, NaCl and CaCl activities, 792
cotton vesicles, development of membrane potential, potassium, 1057
cowpea, respiration, nitrate assimilation, 972
Euphorbia esula, latex starch utilization, 696
lima bean and common bean, nodules, glutamine synthetase, 142
oats, tonoplast vesicles, electrogenic H^+-pumping pyrophosphatase, 497
red spruce seedlings, nitrate reductase, 723
seeds and related proteins, positive and negative varieties, 558
soybean
dark carbon dioxide fixation, role, 200
nodules, phosphoserine aminotransferase, 293
nodules, serine hydroxymethyltransferase, 553
tomato
cadmium-binding protein, 896
plasma membrane ATPase, 1080
white spruce seedlings, morphology and environment relations, 21
Rubber production potential, guayule plants, 1027

S

Safflower, water potential, continuous monitoring, 45
Salinity
during growth, hydrogen pump modulation, *Atriplex nummularia*, 1050
external, proton fluxes, tobacco cell lines, 454
Salt, concentration, auxin stability, culture media, 934
Sclerotinia sclerotiorum, elicitors, parsley cell response, 216
Secale cereale (*see* Winter rye)
Sedum rubrotinctum, leaf water potential and crassulacean acid, reponse to prolonged drought, 678
Seed
Arucaria araucana and *A. angustifolia*, multiple forms of α-amylase, 1062
chestnut, germinating, amino acid content, 692
cotton, maturing and germinated, catalase heterogeneity, 1134
lettuce
ethylene role, germination, 780
ethylene synthesis, thermoinhibition of germination, 950
rapeseed, high osmoticum and embryo development, 907
soybean
linoleic acid, oleic acid metabolism comparison, 41
positive and negative varieties, roots and related proteins, 558
Seedling
castor bean, macrocyclic diterpene casbene, biosynthesis, 335, 343
chestnut, amino acid content, 692
corn, photomorphogenesis, altered axial light gradient, 75
mung bean
glycoprotein processing, mannosidase I, 383
N-acetylglucosamine, purification and properties, 1086
red spruce, nitrate reductase, primary roots, 723
white spruce, root respiration, morphology and environment relation, 21
Selenastrum minutum, N-limited, photosynthetic suppression, nitrate and ammonium, 273
Serine hydroxymethyltransferase, root nodules, soybean, 553
Shoot
apical meristem, hexokinase activity, *Dianthus chinensis*, 186
maize, chromatin, protein-synthesizing activity, 404
pea, photoperiod modification, GA_{12} aldehyde metabolism, 991
pea and corn, glutamate synthesis, isolated mitochondria, 754
Sink-source ratios, soybean, carbon and nitrogen remobilization, various night temperatures, 136
Sodium
ion content and ion fluxes, halotolerant *Dunaliella salina*, 92
transport and compartmentation, *Spergularia marina*, 742
uptake, nuclear magnetic resonance, corn root, 925
Sodium chloride, calcium chloride and, ion activities, cotton root growth, 792
Solanum tuberosum (*see* Potato)
Sorghum bicolor
chorismate mutase, isoenzyme comparisons with other plants, 717
induced water stress, physiological changes, 626
leaves, prephenate aminotransferase localization, 711
Soybean
apparent nitrogen fixation, carbohydrate partitioning, plants grown outdoors, 280
carbon and nitrogen remobilization, sink-source ratios, 136
glycerolipids, water stress response, 798
hypocotyls, plasma membrane and tonoplast isolation, 177
leaves
amino acid transport, protoplasts, 8
ribulose biphosphate carboxylase, purification and degradation, 97
lectin-positive and -negative varieties, related proteins in seeds and roots, 558
mutants
constitutive nitrate reductase-deficient, characterization, 572
lack of NADH:nitrate reductase, 593
nodules, α,α-trehalose metabolism, enzymes, 538
oleic acid metabolism, comparison, linoleic acid, 41
ovary growth, anthesis to abscission of aborting ovaries, 1069
polyphenoloxidase in higher plants, translation product analysis, 614
root nodules
dark carbon dioxide fixation, role, 200
phosphoserine aminotransferase, 293
serine hydroxymethyltransferase, 553
sugarcane and, stromatal response, light and vapor pressure difference, 865
water potential, continuous monitoring, 45
Spergularia marina, sodium transport, compartmentation and, 742
Sperm cells, isolation, pollen, *Plumbago zeylanica*, 317
Spinach
broken chloroplasts, light dependent reduction of pertechnetate, 1003
chloroplasts, CO_2 fixation, disappearance causes, 81
leaves
buffer capacities, 597

cell division and expansion, chloroplast DNA, 708
leu-proteinase, purification and characterization, 872
limitation of photosynthesis
carbon metabolism, excess electron transport capacity, 1115
carbon metabolism, limited triose phosphate utilization, 1123
polyphenoloxidase in higher plants, translation product analysis, 614
Spinacia oleracea (*see* Spinach)
Spores, *Anemia phyllitidis*, aphidicolin inhibition, DNA synthesis, 714
Spruce, needles, buffer capacities, 597
Starch, enzyme level and, chloroplast phosphoglucose isomerase, *Clarkia xantiana*, 367
Starch synthase, heat inactivation, endosperm tissue, wheat, 448
Stem
Euphorbia esula, latex starch utilization, 696
oats and corn, phytochrome-controlled elongation, photobiology, 533
rubber production potential, guayule plants, 1027
Vicia faba, sucrose transport and phloem unloading, 482
Stomata, *Hedera helix* leaves, light and drought stress, 768
Storage proteins, hydrolysis, barley endosperms, 901
Stromata
pea chloroplasts, neural peptidases, 603
response, soybean and sugarcane, light and vapor pressure difference, 865
Suberization, anionic peroxidase, wound-healing, potato tuber tissue, 487
Substrates, determinants of specificity, role of metal, ribulosebisphosphate carboxylase, 943
Sucrose
degradation, novel synthase pathway, sycamore, 1008
synthesizing enzymes, carbon export and carbohydrate content, cotton leaf, 584
transport
phloem unloading and, *Vicia faba* stem, 482
turgor regulation, sugar beet taproot tissue, 478
Sugar beet, taproot tissue, sucrose transport, turgor regulation, 478
Sugarcane, soybean and, stromatal response, light and vapor pressure difference, 865
Sulfoquinovosyldiacylglycerol, phosphatidylglycerol and, fatty acid composition, chilling sensitivity, 946
Sulfur, iron and, clusters, aconitase and potato mitochondria, 247
Sunflower
hypocotyl segments
boron- and calcium-deficient, indole-3-acetic acid transport, 646, 651
polar calcium flux, 408
water potential, continuous monitoring, 45
Sweetclover, chlorophyll *b*-deficient mutant, temperature-sensitive, 329
Sycamore
Golgi membrane system, H^+-ATPase, 222
sucrose degradation, novel sucrose synthase pathway, 1008
vacuoles, abnormal proteins, rapid degradation, 460
Symplasm, functional, sodium transport and compartmentation, *Spergularia marina*, 742

T

Taproot tissue, sugar beet, sucrose transport, turgor regulation, 478
Temperature
effect of irradiance and, carbohydrate level and growth, tomato, 1075
heat shock response, *Gladiolus X gandavensis*, dormancy effect, 259
high, respiratory CO_2 as carbon source, CAM plants, 390
light and, anthrocyanin production, cabbage, 922
low
adenine nucleotide changes, winter wheat cells, 361
water stress and, citrus flower induction, 26
winter rye leaf development, detergent solubilization of thylakoid membranes, 471
night, carbon and nitrogen remobilization, soybean sink-source ratios, 136
sensitive chlorophyll *b*-deficient mutant, sweetclover, 329
Thidiazuron, induction, cytokinin activity, radish, 681
Thiol, glycerate metabolism, leaf extracts, 656
Threonine, cystathionine and, phosphate and adenosine monophosphate effects, *Lemna paucicostata*, 577
Thylakoid membranes, detergent solubilization, low temperature development, winter rye leaves, 471
Tissue
1-(malonylamino)cyclopropane-1-carboxylic acid, conversion to 1-aminocyclopropane-1-carboxylic acid, 637
potassium concentrations, regulation model, plasmalemma influx, 1
Tobacco
cells, promotor expression vectors, development and use, 86
oxygen evolution, single protoplasts, 854
polyphenoloxidase in higher plants, translation product analysis, 614
suspension-cultured, amino acid transport, 36
tomato/potato/*Arabidopsis thaliana* and, transformation, binary Ti vector system, 301
wild type and sodium chloride-adapted cells, proton fluxes, 454
Tomato
carbohydrate level and growth, effect of irradiance and temperature, 1075
fruit ripening, gene expression changes, 395
monoclonal antibodies, plant growth regulators, 516
polyphenoloxidase in higher plants, translation product analysis, 614
ripening, membrane senescence, 954
root, plasma membrane ATPase, 1080
roots, cadmium-binding protein, 896
tobacco/potato/*Arabidopsis thaliana* and, transformation, binary Ti vector system, 301
Tonoplast vesicles
beet
H^+-ATPase stimulation and inhibition, 120
separation, ATPase and pyrophosphatase, 126
oat roots, electrogenic H^+-pumping pyrophosphatase, 497
soybean hypocotyls, isolation and plasma membrane, 177
α,α-Trehalose, metabolism, enzymes, soybean nodules, 538
Trichoderma, mutants, absorbance changes, light-induced, 726
Trifolium repens (*see* White clover)
Triose phosphate, limited utilization, photosynthesis limitation by carbon metabolism, spinach, 1123
Triticum aestivum (*see* Winter wheat)
Turgor, regulation, sucrose transport, sugar beet taproot tissue, 478
Turnip, nicotinamide adenine dinucleotide, mitochondria responses, 587

U

UDP-glucose
glucosyltransferases, gel-electrophoretic separation, *Agrobacterium tumefaciens* and *Acetobacter xylinum*, 913
incorporation, cell wall glucans and lipids, cotton fibers, 464
sucrose degradation, novel synthase pathway, sycamore, 1008
Ulva, photosynthesis, oxygen, carboxylase activities and CO_2 incorporation pattern, 937
Ureide synthesis, detection, two indirect methods, nodulated legumes, 566

V

Vaccinium ashei (*see* Blueberry)
Vacuoles
Acer pseudoplatanus, abnormal proteins, rapid degradation, 460
Papaver bracteatum, compartments, alkaloids and dopamine, 161
red beet, electrical noise measurements, ATPase activity, 1147
Vapor pressure, light and, stromatal response, soybean and sugarcane, 865
Vectors, binary Ti system, transformation, tobacco/tomato/potato/*Arabidosis thaliana*, 301
Vicia faba
abscisic acid accumulation, isolated guard cells, water stress, 1017
oxygen evolution, single protoplasts, 854
polyphenoloxidase in higher plants, translation product analysis, 614
stem, sucrose transport and phloem unloading, 482
Vigna radiata (*see* Mung bean)
Vigna unguiculata (*see* Cowpea)
Vitis vinifera (*see* Grapevine)

W

Water potential
continuous monitoring, 45
psychometric measurements, rapid leaf-disc sampler, 684
Sedum rubrotinctum leaf, crassulacean acid metabolism, response to prolonged drought, 678

Water stress
abscisic acid accumulation, isolated guard cells, *Pisum sativum* and *Vicia faba*, 1017
drought, phosphorus deficiency and chlorophyll *a*, *Pinus radiata*, 423
glycerolipids, soybean, 798
induced, physiological changes, *Sorghum bicolor*, 626
light and, stomatal responses, *Hedera helix*, 768
low temperature effects and, flower induction, citrus, 26
Wheat
ADP-glucose pyrophosphorylase, tissue-specific forms, 642
bean leaves and, CO_2 compensation point and respiration, 379
chloroplast proteins, biosynthesis, 60
endosperm tissue, starch synthase, heat inactivation, 448
etiochloroplasts, photosystem I polypeptide, synthesis, 705
grains and leaves, acid carboxypeptidases, 823
water potential, continuous monitoring, 45
White clover, ureide synthesis detection, two indirect methods, nodulated legumes, 566
White spruce, seedlings, root respiration, morphology and environment relation, 21
Winter rye
low temperature stress, adenosine nucleotide changes and energy charge, 361
postanthesis nitrate assimilation, 17
thylakoid membranes, detergent solubilization, low temperature leaf development, 471
Winter wheat, postanthesis nitrate assimilation, flat leaf reduction, 17
Wound-healing, potato tuber tissue, suberization, anionic peroxidase, 487

Z

Zea mays (*see* Corn)
trans-Zeatin riboside, dihydrozeatinriboside and, monoclonal antibodies, tomato, 516
Zein, proline-rich, cDNA, primary structure, 70